WORK INSTRUCTION

Title: **Annual and Five-Year Maintenance Inspections**

Instruction No. RH.08 Rev. 0.1, October 2003 Page 1 of 9

Approved for Use by: Michael R. Brown Effective Date: October 2003

Applicable Drawings:

- X-106-500-SNP (Sheet 1-9) RH-TRU 72-B Packaging SARP Drawings

SARP Requirements:

- Chapter 8.0, Section 8.2. Annually inspect IV.
- Chapter 8.0, Section 8.2. Annually inspect components. Replace fasteners every five years.
- Chapter 8.0, Section 8.2. Annually perform sealing area inspection.
- Chapter 8.0, Section 8.2. Annually replace all gaskets (O-rings).
- Chapter 8.0, Section 8.2. Perform structural integrity tests every five years.
- Chapter 8.0, Section 8.1. Perform visual and liquid penetrant inspections upon completion of pressure test.
- Chapter 8.0, Section 8.2.2. Perform maintenance leakage rate testing in accordance with ANSI N14-5. Periodic leakage rate test.
- Chapter 8.0, Section 8.2.3.2. Annually remove pipe plugs on impact limiter and visually inspect foam for deviations from design requirements.

Tools Required:

- None required. Tools are listed in other implementing RH work instructions.
- Record all serial numbers (S/N) and calibration due dates on Maintenance Records for all torque wrenches used.

Spare Parts Required:

- Parts are covered by other implementing RH work instructions.

Materials Required:

- Materials are covered by other implementing RH work instructions.

Safety Requirements:

- Safety will be observed in accordance with site requirements.

Prerequisite Conditions:

- All personnel performing maintenance on 72-B casks shall be qualified per DOE/WIPP 02-3283, RH Packaging Program Guidance.
- Nondestructive examination personnel shall be certified in accordance with the requirements of the American Society of Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A.
- Personnel performing leak testing shall be certified in accordance with ASNT Recommended Practice No. SNT-TC-1A, June 1980 edition and supplements.
- The packaging is due for annual or five-year scheduled maintenance.

Annual Requirements:

1.0 Perform visual inspection of the IV per Attachment 1.

- Replace the components listed with an annual frequency (A).
- Attach the completed inspection checklist (Attachment 1) to the Maintenance Record.

2.0 Perform visual inspection of the OC per Attachment 2.

- Replace the components listed with an annual frequency (A).
- Attach the completed inspection checklist (Attachment 2) to the Maintenance Record.

3.0 Perform visual inspection of the impact limiters per Attachment 3.

- Attach the completed inspection checklist (Attachment 3) to the Maintenance Record.

4.0 Perform annual dimensional inspections per the following work instructions:

- WI-RH.06

5.0 If indications are found during the visual inspection, perform a liquid penetrant inspection of the area. If evidence of corrosion is found in the IV, a liquid penetrant inspection of the IV interior surface, including accessible shell, head, flange and weld surfaces, shall be performed per ASME Boiler and Pressure Vessel Code, Section V, Article 6, and ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NB, Article NB-5000.

- Attach a copy of the inspection report to the Maintenance Record.

6.0 Record indications of cracking or distortion on a nonconformance report (NCR) and disposition before corrective actions.

7.0 Perform helium leak testing of the IV structure and seals.

- Attach a copy of the test report to the Maintenance Record.

8.0 Perform helium leak testing of the OC structure and seals.

- Attach a copy of the test report to the Maintenance Record.

Five-Year Requirements:

1.0 Replace the components listed in Attachments 1 and 2 with an annual (A) and a five-year frequency.

2.0 Perform visual inspection of IV internal accessible base material and welds for plastic deformation and cracking.

- Attach a copy of the inspection report to the Maintenance Record.

3.0 Perform a liquid penetrant inspection of the entire IV interior surface, including accessible shell, head, flange and weld surfaces per ASME Boiler and Pressure Vessel Code, Section V, Article 6, and ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NB, Article NB-5000.

- Attach a copy of the test report to the Maintenance Record.

4.0 Record indications of cracking or distortion on an NCR and disposition before corrective actions.

5.0 Perform helium leak testing of the IV containment seals and structure.

- Attach a copy of the test report to the Maintenance Record.

6.0 Perform helium leak testing of the OC containment seals and structure.

- Attach a copy of the test report to the Maintenance Record.

Verification Requirements:

- All work performed is described on the Maintenance Record.
- Deficiencies found during inspections have been corrected and annotated on the Maintenance Record.
- Any additional instructions or travelers are attached to the Maintenance Record.
- Work instructions are listed on the Maintenance Record.
- All data sheets are attached to the Maintenance Record.

ATTACHMENT 1 - IV INSPECTION CHECKLIST

Packaging Serial Number: _____ Date: _____ Job Number: _____

Component/Part Number	Acceptance Criteria	(1)	(2)	(3)	(4) WIPP PO Number (*only if replaced*)
IV Loose Components					
IV Gas Sampling Port Closure Bolt (2078-200-10)	No damaged threads or damaged head				
IV Gas Sampling Port Closure Bolt Outer O-ring Seal (2078-200-01)	No visible damage			**A**	
IV Gas Sampling Port Closure Bolt Inner O-ring (2078-200-02)	No visible damage			**A**	
IV Backfill Port Closure Bolt (2078-200-11)	No damaged threads or damaged head				
IV Backfill Port Closure Bolt O-ring Seal (2078-200-03)	No visible damage			**A**	
IV Seal Test Port Closure Bolt (2078-200-12)	No damaged threads or damaged head				
IV Seal Test Port Closure Bolt O-ring (2078-200-04)	No visible damage			**A**	
Inner Vessel Lid, Inner O-ring (2078-200-05)	No visible damage			**A**	
Inner Vessel Lid, Middle O-ring Seal (2078-200-06)	No visible damage			**A**	
Inner Vessel Lid, Outer O-ring (2078-200-07)	No visible damage			**A**	
IV Lid Closure Bolt (2078-200-13)	No damaged threads or damaged head			**5**	
IV Lid Closure Bolt Spring (2078-200-14)	No visible damage				

(1) A check in this column indicates that the item has been visually inspected and cleaned as necessary.
(2) A check in this column indicates that the item has been replaced.
(3) An “A” in this column indicates that this item is required to be replaced during annual maintenance; A “5" indicates this item is to be replaced during 5-year maintenance.
(4) Record the WIPP purchase order number of the item or component that was replaced in this column.
(5) Record initials of person performing step on Maintenance Record.

ATTACHMENT 1 - IV INSPECTION CHECKLIST

Component/Part Number	Acceptance Criteria	(1)	(2)	(3)	(4) WIPP PO Number (*only if replaced*)
IV Body Components					
IV Lid Closure Bolt Threaded Inserts (2078-200-15)	No damaged threads or missing insert lock keys				
IV Upper, Lower and Middle Flange Sealing Surfaces (grooves and flats)	No scratches causing leakage (finish must be maintained at a maximum 125 RMS micro-inches finish)				
IV Visible Shell Wall Surfaces	No gouges causing wall thickness to be < 0.365 in., or weld cracks or punctures. Shell thickness in the ground weld joints will be > 0.325 in.				
IV Visible Body Inner Surfaces	No signs of corrosion				
IV Bottom Forging Surfaces	No gouges causing wall thickness to be < 1.438 in., or weld cracks or punctures				
IV Lid components					
IV Painted Markings	Markings are clear and not worn				
IV Visible Lid Surfaces	No gouges causing lid thickness to be < 6.25 in., or weld cracks or punctures				
IV Seal Test Port Insert (2078-200-18)	No damaged threads or damaged sealing area				
IV Backfill Port Insert (2078-200-16)	No damaged threads or damaged sealing area				
IV Gas Sampling Port Insert (2078-200-17)	No damaged threads or damaged sealing area				

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(4) Record the WIPP purchase order number of the item or component that was replaced in this column.
(5) Record initials of person performing step on Maintenance Record.

ATTACHMENT 2 - OC INSPECTION CHECKLIST

Packaging Serial Number: _____ Date: _____ Job Number: _____

Component/Part Number	Acceptance Criteria	(1)	(2)	(3)	(4) WIPP PO Number (*only if replaced*)
OC Loose Components					
OC Gas Sampling Port Closure Bolt (2078-300-10)	No damaged threads or damaged head				
OC Gas Sampling Port Closure Bolt O-ring (2078-300-01)	No visible damage			**A**	
OC Seal Test Port Closure Bolt (2078-300-11)	No damaged threads or damaged head				
OC Seal Test Port Closure Bolt O-ring (2078-300-02)	No visible damage			**A**	
OC Lid Inner Main O-ring (2078-300-03)	No visible damage			**A**	
OC Lid Outer Main O-ring (2078-300-04)	No visible damage			**A**	
OC Lid Closure Bolts (2078-300-12)	No damaged threads or damaged head			**5**	

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(3) An “A” in this column indicates that this item is required to be replaced during annual maintenance; A “5" indicates this item is to be replaced during 5-year maintenance.
(4) Record the WIPP purchase order number of the item or component that was replaced in this column.
(5) Record initials of person performing step on Maintenance Record.

ATTACHMENT 2 - OC INSPECTION CHECKLIST

Component/Part Number	Acceptance Criteria	(1)	(2)	(3)	(4) WIPP PO Number (*only if replaced*)
OC Body Components					
OC Lid Closure Bolt Threaded Inserts (2078-300-13)	No damaged threads or missing insert lock keys				
Impact Limiter Bolt Threaded Inserts (2078-400-13)	No damaged threads or missing insert lock keys				
OC Upper and Lower Flange Sealing Surfaces (grooves and flats)	No scratches causing leakage (the finish shall be maintained at a maximum 125 RMS micro-inches finish)				
Trunnions	No excessive wear, galling, or distortion				
OC Painted Markings	Markings are clear and not worn				
OC Visible Shell Inner Wall Surfaces	No gouges causing wall thickness to be < 0.990 in., or weld cracks, or punctures. Shell wall thickness in the ground weld joints will be > 0.950 in.				
OC Thermal Shield Inspection	No gouges causing shield thickness to be < 0.123 in. General cleanliness, no dents, cuts and/or punctures that exceed min. wall thickness, indications of loss of weld integrity				
OC Bottom Forging Surfaces	No gouges causing wall thickness to be < 4.875 in., or weld cracks, or punctures				

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(4) Record the WIPP purchase order number of the item or component that was replaced in this column.
(5) Record initials of person performing step on Maintenance Record.

ATTACHMENT 2 - OC INSPECTION CHECKLIST

Component/Part Number	Acceptance Criteria	(1)	(2)	(3)	(4) WIPP PO Number (*only if replaced*)
OC Lid Components					
OC Visible Lid Surfaces	No gouges causing lid thickness to be < 5.875 in. or weld cracks or punctures				
OC Seal Test Port Insert (2078-300-14)	No damaged threads or damaged sealing area				
OC Gas Sampling Port Insert (2078-300-15)	No damaged threads or damaged sealing area				

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(2) A check in this column indicates that the item has been replaced.
(3) An “A” in this column indicates that this item is required to be replaced during annual maintenance; A “5" indicates this item is to be replaced during 5-year maintenance.
(4) Record the WIPP purchase order number of the item or component that was replaced in this column.
(5) Record initials of person performing step on Maintenance Record.

ATTACHMENT 3 - IMPACT LIMITER INSPECTION CHECKLIST

Component/Part Number	Acceptance Criteria	(1)	(2)	(3)	(4) WIPP PO Number (*only if replaced*)
Impact Limiter Components					
Plastic Pipe Plugs (2078-400-15)	No damaged or stripped threads				
Foam	No deviations from design requirements which prevent intended function, including cracks or voids and moisture				
Impact Limiters	General cleanliness, no dents, cuts and/or punctures, indications of loss of weld integrity				
Upper and Lower Impact Limiter Closure Bolts (2078-400-10 and 400-11)	No damaged threads or damaged head			**5**	
Impact Limiter Lift Lug Assembly (2077-400-16)	No obvious wear on ID. No dents, cracks, gouges, or distortions on or around lifting eye				

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(2) A check in this column indicates that the item has been replaced.
(3) An “A” in this column indicates that this item is required to be replaced during annual maintenance; A “5" indicates this item is to be replaced during 5-year maintenance.
(4) Record the WIPP purchase order number of the item or component that was replaced in this column.
(5) Record initials of person performing step on Maintenance Record.